
Space Weather Forecast

Issued on Monday, 17 January 2022 at 01:06 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales <https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales>

Space Weather Forecast Headline: Chance of M-class flares (R1/R2 radio blackouts) throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low with only Common-Class flares over the past 24 hours. There are currently 7 sunspot regions on the visible disc. Two regions in the northwest quadrant have the most complexity but no significant flare activity. Regions in the northeast and southeast are showing signs of development. The remaining sunspot groups are relatively small and simple. A Coronal Mass Ejection from the northwest of the Sun on the 15th January may give a weak glancing blow at Earth early on the 17th. although this risk is diminishing, otherwise there are no Earth-directed CMEs visible in available imagery.

Solar Wind / Geomagnetic Activity: Solar wind speeds are indicative of a fast wind from a coronal hole. Wind speeds started the period at strong levels, with a peak of 642km/s at 16/0249UTC, before declining to elevated levels, ranging between 550-600 km/s throughout much of the period. Total interplanetary magnetic field strength was mostly weak throughout the period. The all important north-south component was also weak. Geomagnetic activity was mainly Quiet to Unsettled, with Active intervals at 16/0000-0300UTC and 16/1800-2100UTC.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be Low to Moderate, with further Common-class flares expected and a chance of Moderate-class flares. Another two regions are expected to rotate on from the far side within the next 24 hours, and this further increase solar activity.

Solar Wind / Geomagnetic Activity: No Earth-directed CMEs are currently expected, although a CME is expected to pass close to Earth possibly early on Day 1 (17 Jan), although this risk is diminishing. The solar wind is expected to remain elevated to slightly elevated on Days 1 & 2 (17-18 Jan), with a gradual return to background levels from Day 3 (19 Jan) as the effects of a coronal hole begin to wane. Unsettled to Active periods are likely early on Day 1 (17 Jan), with a slight chance of an isolated G1/Minor Storm still possible at first, due to a diminishing risk of a glancing blow from a close passing CME. Geomagnetic activity is then expected to decline to Quiet to Unsettled levels from Day 2 (18 Jan) onwards.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain at predominantly background levels with no solar radiation storms currently expected.

Geomagnetic Storms:

Geo-Magnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	10	1	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 M Class	No	40	40	40	40
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms	Level (cm ⁻² sr ⁻¹ s ⁻¹)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	2	2	2	2
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = cm⁻²sr⁻¹s⁻¹)